

Foreword about Martin Kyselak, Associate Professor of the Department of Electrical Engineering, Faculty of Military Technology, University of Defence in Brno, Czech Republic.

Martin Kyselak was born in Brno, Czech Republic in 1981. He graduated (2005) from Brno University of Technology, Faculty of Electrical Engineering and Communication, in the field of Electronics and Communication. His dissertation (2009) was engaged in studies covering the increase of transmission speed over optical fibres using the multiplex. A part of his work was to suggest measures for lowering unfavourable effects, such as chromatic and polarization dispersion, on signal transmission over optical fibres. He finished his habilitation (2019) in Optical Communication at the Faculty of Electrical Engineering in the University of Defence. His current research focuses on the technology of special PM (Polarization Maintaining) fiber applications. Currently, he is an associate professor and the head of the Department of Electrical Engineering, Faculty of Military Technology, University of Defence in Brno. His main research fields include polarization in optical communication and polarization of light for sensing purposes.



Martin Kyselak

The Department of Electrical Engineering specializes in theoretical electrical engineering, electronic circuits and signals, electric power engineering, electromechanics and power electronics, electromagnetic fields and EMCs (Electromagnetic Compatibility), electronic components and functional blocks, electronic measurements, automated measurement systems, optoelectronics and fibre optics. The Department oversees the teaching of basic subjects for bachelor's and master's students in the electrotechnical specialization. It further offers subjects for doctoral study within the given field. The Department pursues scientific research in the fields of theoretical and experimental electrical engineering, analog and digital circuits, optoelectronics, polarization technology, and fiber technology. Furthermore, it focuses on researching new components (memristors, memcapacitors, meminductors) and their applications (international cooperation, publications in prestigious magazines). Further research is devoted to special methods of analog and digital signal processing with applications in, for example, DFT (Discrete Fourier Transform) spectral analysis, QCM (Quartz Crystal Microbalances) sensors, or new methods for the non-destructive testing of materials. Additionally, the Department conducts research into optical fiber sensors of physical quantities, telecommunication multiplex systems and the properties of polarized light for communication, sensory and military purposes.

Fiber optic sensors have been of interest to fiber technology scientists for many years. Due to their non-electrical nature, these sensors are suitable for many applications, including military usage. They can be found in dangerous Explosion-Proof environments and in biomedical applications. They are non-electric, safe, and even cheap. The principle of fiber optic polarization sensors is based on the physical properties of polarization maintaining fibers that maintain the orthogonality of two optical waves spreading at different speeds. Polarizing sensors are extremely fast and sensitive, and therefore popular. Their uses are also expanding to the armies of the NATO (North Atlantic Treaty Organisation) Alliance. For all applications, a relatively long supply line is always required, and it forms the main advantage of all fiber optic sensors. It is this long supply line that is the subject of research at our department. If you are interested, do not hesitate to contact us.

Dear readers,

I am a teacher of soldiers and future military officers. Every day, I see their tireless pursuit of education in the field so that they will always be ready to defend their homeland with the greatest commitment and knowledge. I wish the same for you – to always be perfectly passionate about science and research for the welfare of our society and not only for your own benefit. I wish for us all to live in peace and good health. Let us together contribute as scientists to the healing of society. Therefore, I wish you a pleasant reading of the newest research in our popular scientific field.